DIMENSIONS:

DIMENSIONS ARE IN MILIMETRES, UNLESS OTHERWISE NOTED
LEVELS ARE IN METERS RELATIVE TO MEDITERRANEAN MEAN LEVEL (LMM)
ANGLES ARE IN DEGREES (0–360°)

CODES AND REQUIREMENTS:

- NTC 08: DM 14.1.2008 TECHNICAL CONSTRUCTION STANDARD
- CG1000–PRGDPGE–0000000000–02A–DESIGN BASIS–STRUCTURAL

STRUCTURAL CONCRETE:

ALL STRUCTURAL CONCRETE TO BE IN ACCORDANCE WITH EN 206–1:2001 WITH THE FOLLOWING CHANGES AND ADDITIONS:

	TOWER FOUNDATIONS			ANCHOR BLOCKS			TERMINAL STRUCTURES			
CONCRETE TYPE	1 UPPER 6m	2 REMAINING PARTS	3 CONNECTING BEAM	4 MAIN PARTS	5 ANCHOR ZONE/ SADDLE SUPPORT	6 PREFAB. BEAM	7 FOUNDATIONS	8 PIERS	9 DECK SLAB	8 BLINDING CONCRETE
CONCRETE GRADE	C60/75	C30/37	C40/50	C30/37	C35/45	C45/55	C32/40	C40/50	C35/45	C12/15
TIME TO DEVELOP NOMINAL STRENGTH	60 DAYS	60 DAYS	60 DAYS	60 DAYS	60 DAYS	28 DAYS	28 DAYS	28 DAYS	28 DAYS	28 DAYS
ENVIRONMENTAL CLASS	XC4+XS3	XC4+XS3	XC4+XS3	XC4+XS1	XC4+XS1	XC4+XS1	XC4+XS1	XC4+XS1	XC4+XS1	XO
STAINLESS STEEL OUTER REINFORCEMENT	YES	YES	YES	NO	NO	NO	NO	NO	NO	–
CONSISTENCY CLASS	S4/S5	S4/S5	S4/S5	S2/S3	S4/S5	S4/S5	S4/S5	S4/S5	S4/S5	–
MAX. AGGREGATE SIZE	38mm	38mm	38mm	50mm	38mm	32mm	25mm	25mm	25mm*	20mm
CEMENT	CEM III/B IN ACCORDANCE TO EN 197–1									
MAX. TOTAL ALKALI CONTENT OF CEMENT	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	–
MIN. CEMENT CONTENT IN kg/m^3	360	360	360	320	340	340	360	360	360	–
MAX. W/C RATIO	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	–
CHLORIDE CONTENT CLASS	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	–
MAX. ALKALI CONTENT OF CONCRETE	3kg EQUIV. Na_2O PER m^3OF CONCRETE									–
MAX. SULFATE CONTENT OF CONCRETE	4% SO_3 BY WEIGHT OF CEMENT									–
CONCRETE COMPOSITION	PRE–TESTING OF MIXES TO DOCUMENT COMPLIANCE WITH THE DURABILTIY/STRENGHT REQUIREMENTS									–
WATER	FROM PUBLIC SUPPLY DISTRIBUTION NET									
AGGREGATES	NATURAL SAND, NATURAL GRAVEL OR CRUSHED STONE IN ACCORDANCE WITH EN 12620									
MAX. AGGREGATE EXPANSION (ALKALI/SILICA)	0.10% AFTER 14 DAYS ACCORDING TO ASTM C1260									–
MAX. ACID–SOLUBLE SULFATE CONTENT OF AGGREGATES	0.2% ACCORDING TO EN 1744–1									–
ADMIXTURES	ADMIXTURES CONTAINING CHLORIDES SHALL NOT BE USED									–
MAX. CHLORIDE MIGRATION COEFFICIENT, D_D	$4x10^{-12}$ m^2/s AFTER 60 DAYS ACCORDING TO NT BUILD 492									–
NORMINAL COVER TO CARBON STEEL	100	100	100	75	75	75	75	75	100	–
NORMINAL COVER TO STAINLESS STEEL	50	50	50	–	–	–	–	–	50	–
EARLY AGE CRACK REQUIREMENT & CONTROL	TEMPERATURE/STRESS ANALYSIS TO BE PERFORMED TO DOCUMENT THAT MEASURES FOR TEMPERATURE CONTROL WILL ENSURE CRACK–FREE CONCRETE. INPUT PARAMETERS TO THE ANALYSIS TO BE BASED ON ACTUAL DOCUMENTED TRANSIENT (TIME/AGE DEPENDANT) CONCRETE PROPERTIES. MAX. TENSILE STRESS/TENSILE STRENGTH RATIO OF 0.9.									–
MAX. CONCRETE TEMPERATURE DURING HYDRATION	65°C									–
MAX. HEATING IN ADIABATIC CONDITIONS AFTER 3 DAYS	300kJ/kg CEMENT									–
MIN. CURING PERIOD	14 DAYS (ALTERNATIVELY USE OF CURING COMPOUND, WATER RETENTION EFFICENCY INDEX >75% AFTER 72 HOURS)									–
CONSTRUCTION JOINTS	CONSTRUCTION JOINTS SHALL BE CLEANED, FREE OF DUST AND SLURRY AND THROUGHLY SATURATED WITH WATER. THE COARSE AGGREGATES SHALL BE MADE VISIBLE DOWN TO A DEAPTH OF 5 TO 10mm									–

* MAX 10mm FOR PREDALLES

TOLERANCES OF CONCRETE DIMENSIONS

TYPE OF DIMENSIONAL DEVIATION	MAX. TOLERANCE
OVERALL DIMENSION	±25mm
CROSS–SECTIONAL	±10mm
PERPENDICULARITY	8‰
INCLINATION	3‰
LOCAL VARIATIONS (1m MEASURING LENGHT)	8mm
LOCAL VARIATIONS (2m MEASURING LENGHT)	12mm

CONCRETE COVER

NOMINAL COVER TO REINFORCEMENT ACCORDING TO THE ABOVE TABLE FOR STRUCTURAL CONCRETE
THE REINFORCEMENT SHALL BE PLACED WITH A TOLERANCE OF –5/+10mm
CONCRETE SPACERS SHALL HAVE EQUAL OR BETTER DURABILITY THAN STRUCTURAL CONCRETE

CHAMFER

ALL OUTWARD FACING CONCRETE EDGES SHALL HAVE CHAMFER 30x30mm

GROUT FOR GROUTING OF LEVELING FLANGES:

SELF LEVELLING HIGH STRENGTH NON–SHRINK GROUT LIKE PAGEL V1/50

BALLAST FILL

THE FOLLOWING MINIMUM UNIT WEIGHTS SHALL APPLY FOR THE FILL MATERIAL INSIDE ANCHOR BLOCKS

SAND ABOVE WATER	18kN/m^3

THE UNIT WEIGHT OF FILL SHALL BE DOCUMENTED BY DETERMINATION OF UNIT WEIGHTS BY ADEQUATE MODEL TEST

ABBRIVATIONS

℄ CENTRE LINE
R RADIUS
Ø DIAMETER
TS THEORETICAL CABEL POINT AT SPLAY SADDLE
TA THEORETICAL CABEL POINT AT ANCHORAGE
SOP SETTING OUT POINT

REINFORCEMENT

LEGEND FOR REINFORCEMENT:

⑧ 2 Ø20/300 L=7000

- LENGTH OF BAR
- SPACING OF BARS
- DIAMETER OF BARS
- NUMBER OF BARS
- BAR NUMBER

CARBON STEEL SHALL BE GRADE B450C QUALITY (HOT–ROLLED, RIBBED BARS OF WELDABLE QUALITY AND WITH HIGH DUCTILITY) ACCORDING TO EN 10080

STAINLESS STEEL SHALL BE ACCORDING TO AISI 316L

WHERE A REINFORCEMENT BAR INTERSECTS WITH A PRESTRESSING LOOP THE REINFORCEMENT BAR SHALL BE DEVIATED OR CUT. THE GAP IN THE REINFORCEMENT BAR SHALL BE CLOSED BY A NEW BAR OF SUFFICEINT LENGTH (INCLUDING LENGTH OF CUT AND LAP LENGTH) PLACED IN DIRECT VICINITY OF THE CUT REINFORCEMENT BAR

LAP LENGTHS

CONCRETE TYPE	1	2	3	7	8	9
CONCRETE GRADE	C60/75	C30/37	C40/50	C30/37	C35/45	C40/50
BAR DIAMETER	LAP LENGTHS L (mm)					
20	650	990	810	990	900	810
25	810	1250	1000	1250	1100	1000
28	900	1400	1130	1400	1300	1130
30	980	1500	1200	1500	1400	1200
32	1040	1600	1280	1600	1500	1280
36	1170	1800	1440			
40	1290	2000	1610			
30+30	1370	2100	1700			
32+32	1460	2250	1820			
40+40	1870	2800	2300			
32+32+32	1790	2750	2220			

	CONCRETE TYPE	4	5	6
	CONCRETE GRADE	C30/37	C35/45	C45/55
	BAR DIAMETER	LAP LENGTHS L (mm)		
SURFACE REINFORCEMENT	20	1000	990	700
	25	1200	1100	900
	32	1600	1500	1200
HORIZONTAL GENERAL REINFORCEMENT AND ADDITIONAL STRUCTURAL REINFORCEMENT	20	800	750	600
	25	1000	900	750
	32	1350	1200	1000
VERTICAL GENERAL REINFORCEMENT	20	750	700	550
	25	900	750	700
	32	1200	1100	900

MANDREL DIAMETERS FOR BAR BENDING (mm):

BAR DIAMETER	MAIN REINFORCEMENT	STIRRUPS HOOK BENDS AND LOOPS
20	140	140
25	175	175
28	196	196
30	260	260
32	224	224
36	252	252
40	280	280

DISTRIBUTION OF LAPS

UNLESS OTHERWISE SHOWN IN THE DRAWINGS THE FOLLOWING APPLIES:
1. IN GENERAL LAPS SHALL BE DISTRIBUTED SO THAT MAXIMUM 50% OF THE BARS ARE LAPPED WITHIN THE SAME CROSS SECTION.
2. FOR TWO ADJACENT LAPS THE DISTANCE FROM CENTER TO CENTER OF THE SPLICES SHALL MINIMUM BE EQUIVALENT TO THE LAP LENGHT.

POST–TENSIONING TENDONS

EACH TENDON SHALL CONSIST OF THE SPECIFED NUMBER OF 15.7mm STRESS–RELIEVED SEVEN WIRE STRAND COMPLYING WITH EN 10138–3.

EACH STRAND SHALL HAVE THE FOLLOWING PROPERTIES:

DIMENSION	15.7mm (0.6")
NOMINAL AREA	150mm^2
YIELD STRENGTH	1670MPa
TENSILE STRENGTH	1860MPa
MIN. BREAKING LOAD	279kN

THE DUCTS SHALL BE PLACED WITH A TOLERANCE OF –10/+10mm
ANCHORS SHALL BE AN APPROVED PROPRIETARY TYPE. THE REAR OF THE ANCHOR SHALL BE PROVIDED WITH A M10 TAPPED HOLE AT LEAST 15mm DEEP TO ALLOW FOR AN ELECTRICAL EARTHING CONNECTION WITHIN THE CONCRETE.
THE TENDONS SHALL BE POST–TENSIONED WITH A FORCE EQUAL TO 210kN FOR EACH STRAND.
LOOPED TENDONS SHALL BE POST–TENSIONED SIMULTANEOUSLY FROM BOTH ENDS.
AT TENSIONING OF TENDONS THE CONCRETE IN THE PROXIMITY OF THE ANCHORAGE SHALL HAVE A COMPRESSIVE STRENGTH OF MIN. 32/39MPa.
TENDONS IN ANCHOR BLOCKS SHALL BE GROUTED AFTER POST–TENSIONING USING A THIXOTROPIC GROUT TYPE WITH A SIMILAR COMPRESSIVE STRENGTH AS SPECIFIED FOR THE CONCRETE. TENDONS IN TOWER FOUNDATIONS SHALL BE UNBONDED.

POST–TENSIONING BARS

BARS FOR TOWER FOUNDATION CONNECTION BEAM SHALL BE ACCORDING TO EN 10138 WITH ROLLED ON THREADS:

MODULUS OF ELASTICITY 170000 MPa
ULTIMATE TENSILE STRENGTH 1030 MPa
0.1 % PROOF STRESS 835 MPa

Stretto di Messina
Concessionaria per la progettazione, realizzazione e gestione del collegamento stabile tra la Sicilia e il Continente
Organismo di Diritto pubblico
(Legge n° 1158 del 17 dicembre 1971, modificata dal D.Lgs. n° 114 del 24 aprile 2003)

EurolinK

PONTE SULLO STRETTO DI MESSINA

PROGETTO DEFINITIVO

EUROLINK S.C.p.A.
IMPREGILO S.p.A. (Mandataria)
SOCIETA' ITALIANA PER CONDOTTE D'ACQUA S.p.A. (Mandante)
COOPERATIVA MURATORI E CEMENTISTI - C.M.C. di Ravenna Soc. Coop. a.r.l. (Mandante)
SACYR S.A.U. (Mandante)
ISHIKAWAJIMA - HARIMA HEAVY INDUSTRIES CO. Ltd. (Mandante)
A.C.I. S.C.P.A. - CONSORZIO STABILE (Mandante)

IL PROGETTISTA	IL CONTRAENTE GENERALE	STRETTO DI MESSINA	STRETTO DI MESSINA
COWI Ing. E.M. Veje Dott. Ing. E. Pagani Ordine Ingegneri Milano n° 15408	Project Manager (Ing. P.P. Marcheselli)	Direttore Generale e RUP Validazione (Ing. G. Fiammenghi)	Amministratore Delegato (Dott. P. Ciucci)

OPERA D'ATTRAVERSAMENTO PF0002_F0
SOTTOSTRUTTURE
ELEMENTI DI CARATTERE GENERALE
GENERALE
NOTE GENERALI – INGLESE

CODICE C G 1 0 0 0 P S X D P S T 0 0 0 0 0 0 0 0 0 0 0 2 F0 SCALA:

REV.	DATA	DESCRIZIONE	REDATTO	VERIFICATO	APPROVATO
F0	20-06-2011	EMISSIONE FINALE	LHJ/ABI	IJ	ABI

NOME DEL FILE: PF0002_F0.DWG